

CLAIMS

What is claimed is:

1. A semiconductor device comprising:

a package; and

a die mounted in the package, the die comprising first circuitry to substantially cancel resonance between an inductance of the package and a capacitance of the die.
2. The semiconductor device of claim 1, wherein the first circuitry comprises:

a current source;

an inductor coupled to the current source in series; and

a power supply operable with the current source and the inductor to substantially cancel the resonance.
3. The semiconductor device of claim 2, wherein the current source comprises a resistor.
4. The semiconductor device of claim 2, wherein the current source comprises a transistor.
5. The semiconductor device of claim 2, wherein an inductance of the inductor is substantially equal to the inductance of the package.

6. The semiconductor device of claim 1, wherein the first circuitry comprises:

a bulk capacitor; and

second circuitry coupled to the bulk capacitor to drive the bulk capacitor to substantially cancel the resonance.

7. The semiconductor device of claim 6, wherein the second circuitry comprises an amplifier.

8. The semiconductor device of claim 7, further comprising a plurality of preemptive resistors coupled to a first input of the amplifier and for coupling a plurality of current drawing modules in the die to the amplifier to drive the amplifier.

9. The semiconductor device of claim 8, further comprising one or more feedback resistors to couple the bulk capacitor to a second input of the amplifier.

10. The semiconductor device of claim 9, wherein the first circuitry further comprises one or more inductors coupled to the capacitor.

11. The semiconductor device of claim 10, wherein an equivalent inductance of the one or more inductors is substantially equal to the inductance of the package.

12. The semiconductor device of claim 1, further comprising an off-die capacitor, wherein the first circuitry is operable with the off-die capacitor to substantially cancel the resonance.

13. A method comprising:
generating a derivative of an input to a die from a package, the derivative being out of phase relative to the input; and
substantially canceling resonance between an inductance of the package and a capacitance of the die with the derivative.

14. The method of claim 13, wherein generating the derivative comprises driving an inductor that is substantially equal to the inductance of the package.

15. The method of claim 13, wherein generating the derivative comprises driving a bulk capacitor with an amplifier.

16. The method of claim 15, wherein generating the derivative further comprises driving the amplifier with a plurality of current drawing modules in the die, the plurality of current drawing modules being coupled to the amplifier via a plurality of pre-emptive resistors.

17. The method of claim 15, wherein the bulk capacitor is external to the die and the amplifier is on the die.
18. A system comprising:
a dynamic random access memory (DRAM); and
a memory controller coupled to the DRAM, wherein the memory controller comprises
a package, and
a die mounted in the package, wherein the die comprises first circuitry to substantially cancel resonance between an inductance of the package and a capacitance of the die.
19. The system of claim 18, wherein the first circuitry comprises:
a current source;
an inductor coupled to the current source in series; and
a power supply operable with the current source and the inductor to substantially cancel the resonance.
20. The system of claim 19, wherein the current source comprises a resistor.
21. The system of claim 19, wherein the current source comprises a transistor.

22. The system of claim 19, wherein an inductance of the inductor is substantially equal to the inductance of the package.
23. The system of claim 18, wherein the first circuitry comprises:
a bulk capacitor; and
second circuitry coupled to the bulk capacitor to drive the bulk capacitor to substantially cancel the resonance.
24. The system of claim 23, wherein the second circuitry comprises an amplifier.
25. The system of claim 24, wherein the memory controller further comprises a plurality of preemptive resistors coupled to a first input of the amplifier and for coupling a plurality of current drawing modules in the memory controller to the amplifier to drive the amplifier.
26. The system of claim 25, wherein the memory controller further comprises one or more feedback resistors to couple the bulk capacitor to a second input of the amplifier.
27. The system of claim 26, wherein the memory controller further comprises one or more inductors coupled to the capacitor.

28. The system of claim 27, wherein an equivalent inductance of the one or more inductors is substantially equal to the inductance of the package.

29. The system of claim 18, further comprises an off-die capacitor operable with the first circuitry to substantially cancel the resonance.

30. The system of claim 18, further comprising a processor coupled to the memory controller.